Plant Pathology Circular No. 260 Fla. Dept. Agric. & Consumer Serv.
June 1984 Division of Plant Industry

CYLINDROCLADIUM STEM CANKER OF EUCALYPTUS SEEDLINGS

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A number of Cylindrocladium spp. are well documented pathogens of eucalypts (1-12). The files of Florida's Division of Plant Industry include reports of C. scoparium Morgan, C. pteridis Wolf, and C. floridanum Sob. & Seymour on at least seven Eucalyptus spp. In Florida, reports of Cylindrocladium spp. on eucalypt foliage predominate, but C. scoparium infections have been confirmed on roots and stems as well.

Eucalyptus spp. have been grown in commercial nurseries in Florida for some years for use as ornamentals and experimental forest crops for wood fiber, energy wood, and/or solid wood products. In 1978-79 girdling stem cankers, caused by C. scoparium, resulted in the loss of more than 200,000 seedlings of E. grandis Hill ex Maid. and E. robusta Sm., valued at nearly $20,000, in a south Florida tree nursery. This circular describes and discusses these stem cankers. A complete report has been published (5).

FUNGUS BIOLOGY & CANKER DEVELOPMENT. Cylindrocladium scoparium infections on eucalyptus are primarily nursery problems (1,3,4,6,9,10), especially where seedlings are subjected to warm temperatures, high humidity, and close spacing (3,7,10). The fungus produces small (<1mm), multicelled survival structures called microsclerotia (sing., microsclerotium) in infested soils or potting media and infected plant tissues. Microsclerotia are highly resistant to adverse enviromnental conditions (e.g., dessication, lack of suitable hosts, etc.) and many fungicides and soil fumigants. New infections can be incited by microsclerotia as well as by microscopic conidia (asexual spores) which are often produced in profusion on infected plant parts (Fig. 1-C).

Girdling stem cankers typically develop on the lower stems of susceptible seedlings, ca. 3-10 cm above the soil line. They usually occur on seedlings that are several weeks to months old and spaced closely enough to create a closed foliage "canopy", beneath which air movement and drying are restricted. Cankers are frequently initiated at. leaf nodes (Fig. .1-A), apparently a result of fungus penetration through the petioles of infected leaves, although the fungus is capable of direct infection of stems as well. Occasionally, stem lesions are initiated at points where infected leaves have wilted and wrapped around lower stems. Incipient infections are tan to light brown in color and are often not readily distinguished from the typically brown outer bark tissues of older seedlings. Advanced infections are dark brown to black and often result in stem constrictions at or near their centers (i.e., presumably their points of origin) (Fig. 1-B).

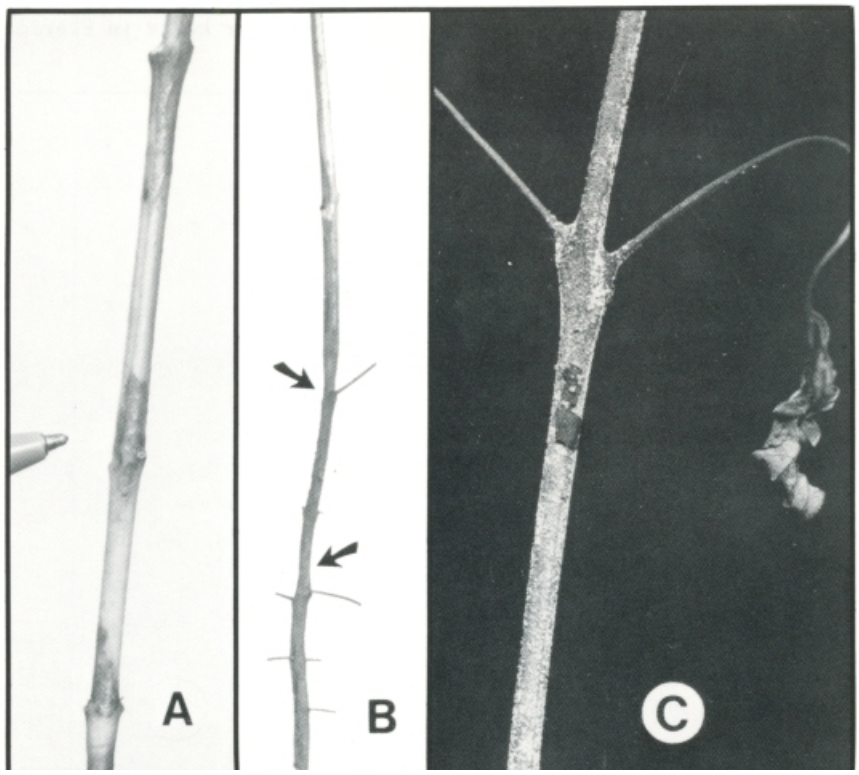

Fig. 1. Girdling stem cankers of eucalyptus caused by Cylindrocladium scoparium. A) Lesions initiated at leaf nodes. B) Advanced stem canker showing typical stem constrictions (arrows). C) Profuse conidial sporulation of C. scoparium on severely infected seedling stem. (UPI Photos #701563, 701624-7, and 701555)

CONTROL. Good nursery practices, including the following, are recommended: 1) using pathogen-free and/or sterilized potting soils and containers, 2) providing adequate space for seedlings to insure good aeration, and 3) minimizing overhead irrigation which wets foliage and spreads inoculum via splashing.

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The removal and destruction of seedlings with advanced stem cankers is warranted. Such seedlings rarely recover following post-infection treatment, and they provide sources of abundant inoculum for new infections. Seedlings with incipient infections, on the other hand, are often capable of full recovery if provided with growing conditions which are not conducive to disease development (4,5).

Several fungicides have been shown to give effective control of C. scoparium on eucalypts (5,7,12). However, fungicide use should be carefully integrated into a full program of good nursery practices and sanitation. Instructions and restrictions on fungicide labels as well as local and federal regulations must be consulted and carefully followed.

SURVEY & DETECTION. Look for brown to black lesions or cankers on lower stems of eucalypts growing in warm humid environments. Lesions frequently occur in association with leaf nodes. Profuse white fungal "blooms" often occur on infected stems, especially if the microenvironment is particularly humid. Stem constrictions at canker centers and/or leaf nodes are commonly associated with advanced cankers.

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Contribution No. 562, Bureau of Plant Pathology.